WHAT IS CLAIMED IS:

1. An electrode deployment apparatus for treatment of tissue in a body lumen, the apparatus comprising:

a plurality of electrodes arranged on a surface of a dimensionally stable support at a pre-selected electrode density; and

an expansion member coupled to the support to deploy and selectively expose a portion of the electrode surface while shielding a remaining portion and maintaining the electrode density.

2. An apparatus as in claim 1, further comprising wiring adapted to connect the electrodes to a radiofrequency power source as a multiplicity of bipolar pairs.

3. An apparatus as in claim 2, wherein the support comprises a non-distensible, electrode backing.

4. An apparatus as in claim 3, wherein at least a portion of the electrode backing is spirally furled about an axis of an expansion member prior to deployment.

5. An apparatus as in claim 4, wherein the electrodes are aligned in a generally axial direction on the surface of the electrode backing.

6. An apparatus as in claim 4, wherein the electrodes are aligned in a generally transverse direction on the surface of the electrode backing.

7. An apparatus as in claim 1, wherein the electrodes are linear and arranged in a parallel pattern on the support.

8. An apparatus as in claim 1, wherein the electrodes are non-linear and arranged in a parallel pattern on the support.

9. An apparatus as in claim 1, wherein the parallel electrodes have a width in the range from 0.1 mm to 3 mm and a spacing in the range from 0.1 mm to 3 mm.

10. An apparatus as in any one of claims 1 to 9, wherein the expansion member comprises an inflatable balloon.

11. An apparatus as in claim 10, wherein the inflatable balloon inflates elastically.

12. An apparatus as in claim 10, wherein the support is furled at least partially around the balloon, so that the support unfurls as the balloon is inflated.

13. An apparatus as in claim 12, wherein the support is furled in an overlapping manner.

14. An apparatus as in claims 13, further comprising an elastic member coupled to the support to retain the support in contact with the balloon.

15. An apparatus as in claim 12, wherein the support is attached at one end to a surface of the balloon and a second end of the support is unattached and furled around the balloon to overlap the first end.

16. An apparatus as in claim 12, wherein the support is attached at its midpoint to a surface of the balloon, and first and second ends of the support are unattached and furled in opposite directions around the balloon.

17. An apparatus as in claim 16, wherein the first and second ends of the support overlap.

18. An apparatus as in claim 16, further comprising a second support that is attached at its midpoint to a point on the balloon approximately opposite the midpoint of the first support, the two ends of the second support overlapping the ends of the first support as they are furled around the balloon.

19. An apparatus as in claim 10, further comprising a cylindrical container having an axial slot whereas the furled support is within the container and a first end of the backing passes through the slot and around the expandable balloon, the first end of the support being attached to the container, wherein the support unfurls from the container as the balloon is expanded.

20. An apparatus as in claim 19, wherein the support is attached to the balloon at a location proximal to the slot.

21. An apparatus as in claim 19, wherein the support is folded into a plurality of pleats inside the container.

22. An apparatus as in claim 19, wherein a second end of the support is attached to a shaft, the backing being furled about the shaft.

23. An apparatus as in claim 22, further comprising a torsion spring coupled to the shaft.

24. An apparatus as in any one of claims 1 to 9, wherein the expansion member comprises a spiral spring.

25. An apparatus as in claim 24, wherein the spring comprises a spring material selected from the group consisting of 316 stainless steel or nitinol.

26. An apparatus as in claim 24, wherein the support is attached to the outside surface of the spring.

27. An apparatus as in claim 10, further comprising an adhesive applied to selected areas of the backing, the backing folded over on one or more of the adhesive areas to form one or more creases, wherein the creases expand to expose additional electrodes as the balloon inflates.

28. The apparatus of claim 10, further comprising a shaft and a sheath, wherein the support is attached at one end to a distal end of the shaft and spirally furled about the shaft, wherein the balloon is slidably received on the shaft proximal to the support, wherein the balloon and support are retained in the sheath so that they may be advanced past the sheath once the apparatus is positioned at a treatment area, and wherein the balloon is further advanced to the distal end of the shaft to expand the support.

29. An apparatus as in claim 1, further comprising a transesophageal catheter, wherein the expansion member is disposed at a distal end of the catheter.

30. A system for treating tissue, said system comprising the apparatus as in claim 29, and further comprising a RF power source coupled to the plurality of electrodes.

31. An apparatus as in claim 30, further comprising a multiplexer coupled to the plurality of electrodes.

32. An apparatus as in claim 29, further comprising a control device coupled to the plurality of electrodes, the control device providing controlled positioning of the expandable member.

33. An apparatus as in claim 30, further comprising a temperature sensor coupled to the plurality of electrodes.

34. A method for deploying electrodes to treat tissue in a body lumen, said method comprising:

positioning an array of electrodes having a pre-selected electrode density within the body lumen; and

exposing an area of the array sufficient to engage a wall of the lumen while maintaining the electrode density, wherein the size of the exposed area will vary depending on the size of the body lumen.

35. A method as in claim 34, wherein positioning comprises transesophageally delivering the array to a treatment area within the esophagus.

36. A method as in claim 35, wherein transesophageally delivering the array comprises advancing a catheter through the esophagus, wherein the catheter carries the electrode array.

37. A method as in any of claims 34, wherein the array comprises a non-distensible, electrode support that is furled about an axis and wherein expanding comprises unfurling the support to selectively expose a portion of the available electrode area.

38. A method as in claim 37, wherein unfurling comprises expanding an expansion member within the furled support.

39. A method as in claim 38, wherein expanding the expansion member comprises inflating a balloon.

40. A method as in claim 39, further comprising:

furling the support about an axis so that its ends overlap each other;

coupling an elastic member to the support to retain the support from unfurling freely;

placing the balloon within the circumference of the furled support;

advancing the support assembly to a desired treatment region; and

expanding the balloon to deploy the backing against a wall of the lumen.

41. A method as in claim 39, further comprising:

furling a support about the distal end of a shaft having the balloon slidably received on the shaft proximal to the support;

placing the balloon and support inside a sheath;

positioning the sheath assembly near a treatment area;

advancing the balloon and support past the sheath;

advancing the balloon to the distal end of the shaft;

positioning the balloon and support at the treatment area; and

expanding the balloon to deploy the backing against a wall of the lumen.

42. A method as in any of claims 34 to 41, further comprising applying radiofrequency energy to tissue of the body lumen through the electrodes.

43. A method as in claim 42, wherein the radiofrequency energy is applied through a multiplicity of bipolar electrode pairs in the array.

44. A method as in claim 43, wherein the electrodes are parallel, have a width in the range from 0.1 mm to 3 mm, and are spaced-apart by a distance in the range from 0.1 mm to 3 mm.

45. A method as in claim 44, wherein the radiofrequency energy is delivered at a total dosage in the range from 1 joules/cm^2 to 50 joules/cm^2.

46. A method as in claim 45, wherein the radiofrequency energy is delivered over a time period below 5 seconds.